

ZJ-SD NEW

Smart Static Electricity Sensing: Making Static Electricity Visible

- Smart static electricity monitoring.
- Easy on-site operation.
- Best long-distance, high-precision measurements in the industry.

Be sure to read *Safety Precautions* on page 1295.



Features

Smart In-line Measurement of Production Site Static Electricity

Compact Sensor Head and Smart Amplifier

Hand-held devices and large measuring devices are not suitable for easily measuring static charges of workpieces in-line. The Sensor Head of the Smart Electrostatic Sensor is small (6 × 6 × 67 mm) and the bracket has a rotating mechanism, making it possible to mount it even where space is limited.

Smart Static Electricity Monitoring

For effective discharge, measurements must be made at more than one location and changes over time need to be monitored. With the ZJ-SD, multi-point measurements from up to 5 Units can be made easily if a Calculating Unit is connected between Amplifiers. And the Electrostatic Sensor measurement data can be displayed and logged on a personal computer via an Interface Unit and used for static electricity countermeasures.

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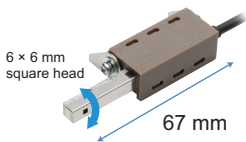
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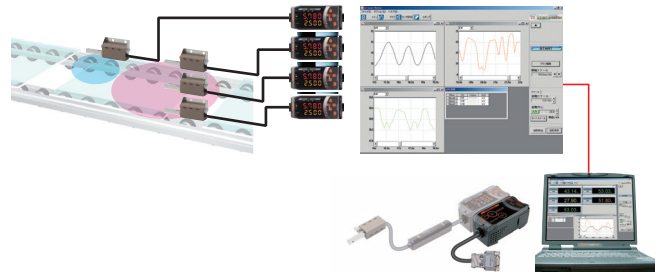
Compact Sensor Head

Smart Amplifier



The bracket on the Head enables changing the sensing direction even after installation.

Direct display of static charge



Our Highest Priority: Easy On-site Operation

Simple Settings Using Key Operations

A seven-segment, two-row display is provided for workpiece charge and threshold displays.

Settings are easy to make using Up, Down, Left, and Right Keys.

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Judgment Output Indicator
OPE1/OPE2/OPE3
three-color indicators

Intuitive Operation Using Up,
Down, Left, and Right Keys

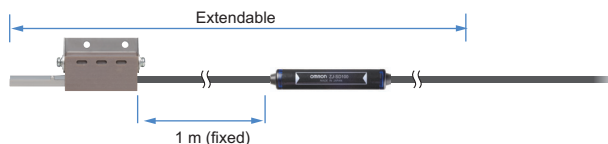


Dual Digital Display
Displays the charge and threshold
after the power is turned ON.

LED character height: 7 mm

Remote Detection

Use the ZX-XC□A (order separately) to extend the cable to 2, 5, or 9 m.



Best Long-distance, High-precision Measurements in the Industry

The ZJ-SD provides the highest detection accuracy in the industry when combined with a ZX Displacement Sensor. And even more precise measurements are possible with the compensation function that adjusts to the size of the workpiece.

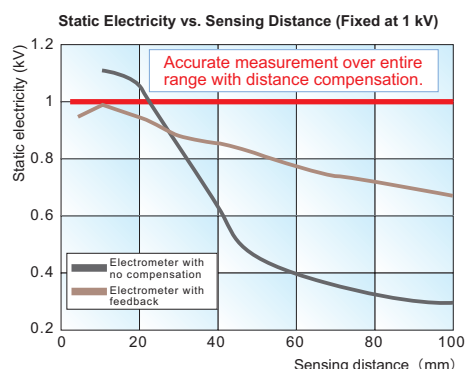
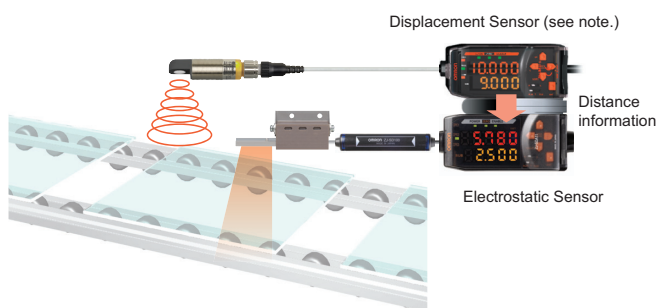
Workpiece Distance Compensation

Long-distance, High-precision Measurements

The best sensing range in the industry at 100 mm/ ±50 kV.

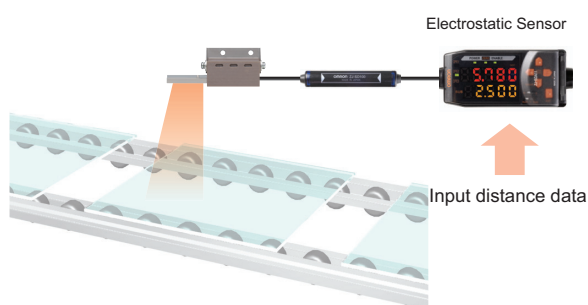
Sensors that measure static charges are greatly affected by the measurement distance. The ZJ-SD solves this problem by combining with a ZX-series Displacement Sensor to enable communicating distance information and thus achieve high-accuracy measurements.

Note: Ultrasonic Displacement Sensors are also available. Contact your OMRON representative for details.



Unaffected by Measurement Distance

In addition to distance data compensation performed by the Displacement Sensor, errors from distance fluctuations can also be reduced by directly inputting the installation distance into the Amplifier.



Workpiece Size Compensation

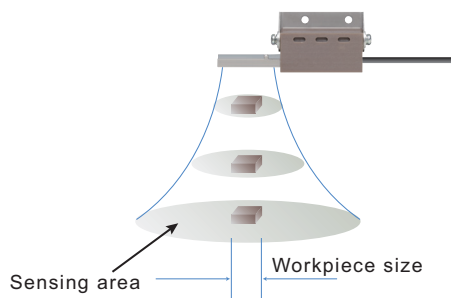
Accurate Static Charge Measurements for Small Workpieces

The Electrostatic Sensor's sensing area is approximately five times the installation distance.

Enter the workpiece size to measure the static charge of workpieces smaller than the sensing area.*

The ZJ-SD can compensate the static charge based on a comparison of the installation distance recorded in the Pre-amplifier and the size of the sensing area.

* Except for the workpiece, static charge inside the sensing area must be 0 V. Use a measurement error of approximately 10% as a guide for a measurement distance of 5 mm and a workpiece of 10 mm in diameter.



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Ordering Information


Electrostatic Sensor Sensor Head

Appearance	Sensing distance	Model
	5 to 100 mm	ZJ-SD100


Accessories (Order Separately) Calculating Unit

Appearance	Model
	ZX-CAL2



SmartMonitor Sensor Setup Tool for Personal Computer Connection

Appearance	Name	Model
 +CD-ROM	Communications Interface Unit and Software for setup and display	ZJ-SFW11

Amplifier Unit

Appearance	Power supply	Output method	Model
	DC	NPN output	ZJ-SDA11


Preamplifier Mounting Brackets

Appearance	Model	Remarks
	ZX-XBT1	Included with Sensor Head
	ZX-XBT2	For DIN Track mounting

Cable with Connectors on Both Ends (for Extension)

Cable length	Model	Quantity
1 m	ZX-XC1A	1
4 m	ZX-XC4A	
8 m	ZX-XC8A	

Sensor Head Mounting Bracket for Distance Compensation

Appearance	Model	Remarks
	ZJ-XBU1	Used for distance compensation using a Displacement Sensor

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Ratings and Specifications

Sensor Head

Item	Model	ZJ-SD100
Applicable Amplifier		ZJ-SDA11
Sensing distance		5 to 100 mm
Measurement voltage		Standard mode: ± 50 kV, Precision mode: ± 5 kV max.*1
Display resolution		Standard mode: 10 V, Precision mode: 1 V *2
Linearity *3		$\pm 5\%$ F.S. *4
Response time		20 ms
Ambient temperature		Operating and storage: 0 to 50°C (with no condensation or icing)
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)
Dielectric strength		1,000 VAC, 50/60 Hz, 1 min *5
Vibration resistance		Sensor Head: 3-mm double amplitude at 10 to 55 Hz for 45 min each in the X, Y, and Z directions, Preamplifier: 1.5-mm double amplitude at 10 to 55 Hz for 2 h each in the X, Y, and Z directions
Degree of protection		IP20
Connection method		Pre-wired Connector (standard length: 2 m)
Weight (packed state)		Approx. 150 g
Materials		Sensor Head: Stainless steel Preamplifier: PC
Accessories		Instruction sheet, Preamplifier Mounting Brackets (ZX-XBT1)

*1. The measurement may become saturated if the Sensor is too close to an object being measured, even if it is within the measurement voltage range. Use the distance from the measurement surface (mm) times 1 kV as a guide.

*2. This is the minimum value obtainable when a ZJ-SDA11 Amplifier Unit is connected.

*3. When the ambient temperature is stable at 25°C.

*4. When the measurement distance is 10 mm and the measurement voltage is -5 to 5 kV.

*5. When a Preamplifier is used (excluding the Sensor Head).

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Amplifier Unit

Item	Model	ZJ-SDA11
Measurement period		1 ms
Possible average count settings *1		1/2/4/8/16/32/64/128/256/512/1,024
Linear output *2		Current output: 4 to 20 mA/FS, Max. load resistance: 300 Ω Voltage output: ±4V (±5V, 1 to 5 V *3), Output impedance: 100 Ω
Judgment outputs (3 outputs: OPE1, OPE2, and OPE3)		NPN open-collector output, 30 VDC, 20 mA max. Residual voltage: 1.2 V max.
Bank shift input, zero reset input, timing input, reset input		ON: Short-circuited with 0-V terminal or 1.5 V or less OFF: Open (leakage current: 0.1 mA max.)
Functions		Measurement value display, display reverse, scaling, peak and bottom hold, distance compensation, present value display, limit number of display digits, monitor focus, mask hold, sensing area compensation, output value display, zero reset, linear output compensation, distance trigger, warning output, setting value display, zero reset memory, peak hold, delay hold, bank switching, resolution display, various timers, bottom hold, delay time setting, enable display, initialization, sample hold, timing inputs, zero reset display, teaching, peak-to-peak, key lock, judgment output display, direct threshold value setting, hold, clamp value setting, ECO mode, hysteresis adjustment, average hold, precise measurement mode
Indications		Operation indicators (OPE1 (orange), OPE2 (green), OPE3 (yellow), 7-segment main digital display (red), 7-segment sub-digital display (yellow), power ON indicator (green), zero reset indicator (green), enable indicator (green)
Power supply voltage		24 VDC ±10%, Ripple (p-p): 10% max.
Current consumption		24-VDC power supply: 140 mA max.
Ambient temperature		Operating and storage: 0 to 50°C (with no icing or condensation)
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)
Insulation resistance		20 MΩ (at 500 VDC)
Dielectric strength		1,000 VAC, 50/60 Hz, 1 min
Shock resistance		Destruction: 300 m/s ² 3 times each in 6 directions (up/down, left/right, and forward/backward)
Vibration resistance		Destruction: 0.7-mm double amplitude at 10 to 150 Hz for 80 min each in the X, Y, and Z directions
Connection method		Pre-wired (standard length: 2 m)
Weight (packed state)		Approx. 350 g
Materials		Case: PBT (polybutylene terephthalate), Cover: Polycarbonate
Accessories		Instruction sheet

*1. The response time of the linear outputs is calculated as follows: Measurement period × (Average count setting + 1). The response time of the judgment outputs is calculated as follows: Measurement period × (Average count setting + 1).

*2. The output can be switched between a current output and voltage output using a switch on the bottom of the Amplifier.

*3. Setting is possible using the monitor focus function.

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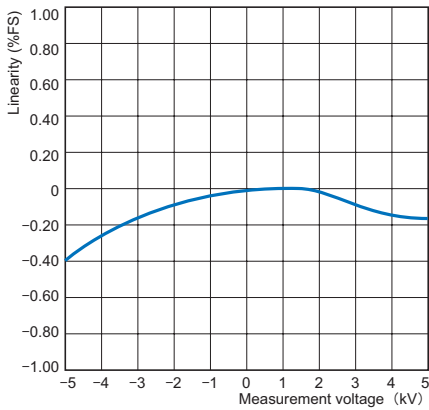
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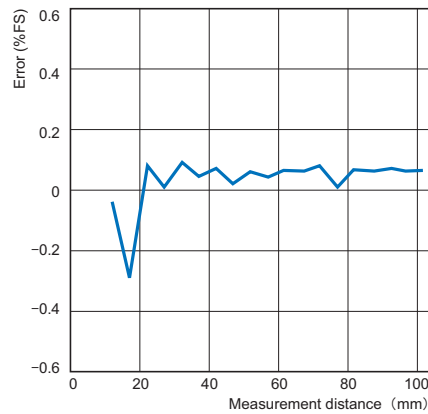
Engineering Data (Typical)

Measurement Voltage vs. Linearity



Measurement object: Charged plate (150 × 150 mm, 20 pF)
 Measurement distance: 10 mm
 Measurement mode: Standard

Measurement Distance vs. Error



Measurement object: Charged plate (150 × 150 mm, 20 pF)
 Measurement voltage: 5 kV
 Measurement mode: Standard
 Measurement after teaching the measurement distance to the Amplifier.

Safety Precautions

Refer to *Warranty and Limitations of Liability* on page F-2.

⚠ WARNING

This product is not designed or rated for ensuring safety of persons. Do not use it for such purpose.



Precautions for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings.

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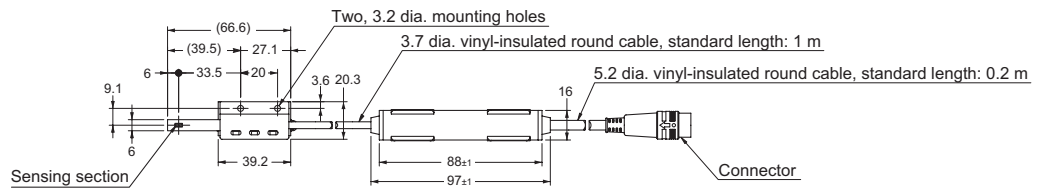
Dimensions

(Unit: mm)

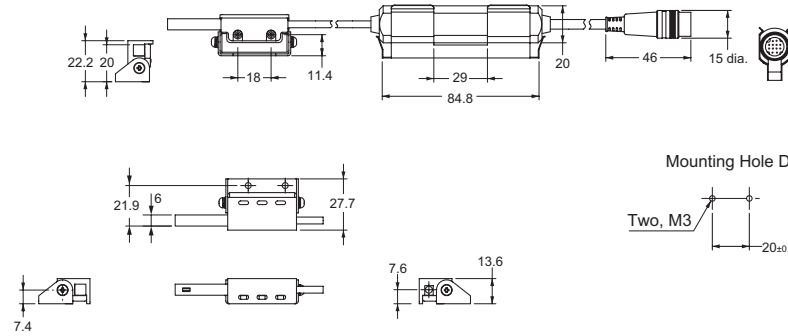
Electrostatic Sensor

Sensor Head ZJ-SD100

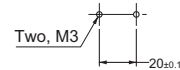
Angle 1



Angle 2



Mounting Hole Dimension



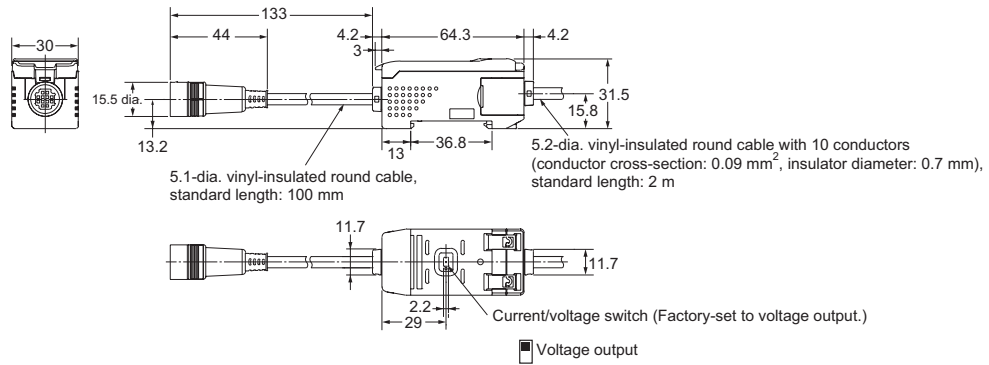
Amplifier Unit ZJ-SDA11

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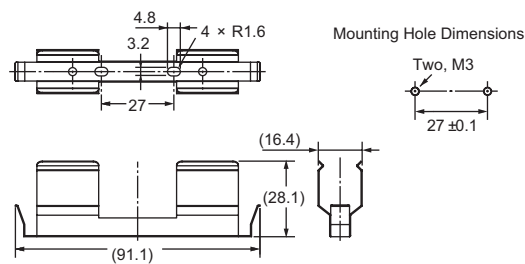
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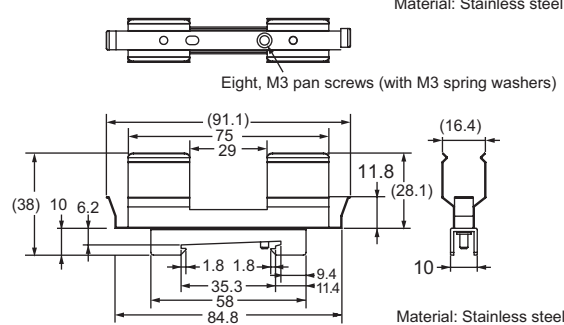
Accessories (Sold Separately)

Preamplifier Mounting Bracket ZX-XBT1



Material: Stainless steel

Preamplifier Mounting Bracket ZX-XBT2



Material: Stainless steel

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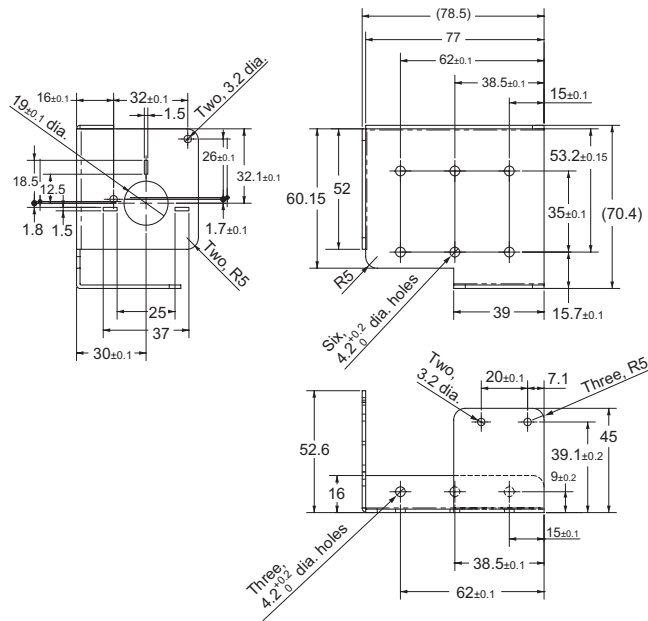
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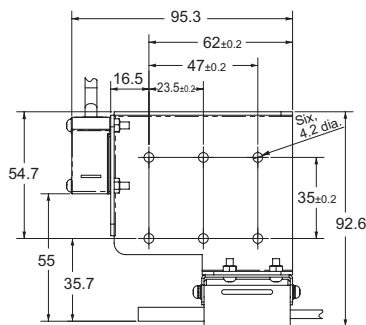
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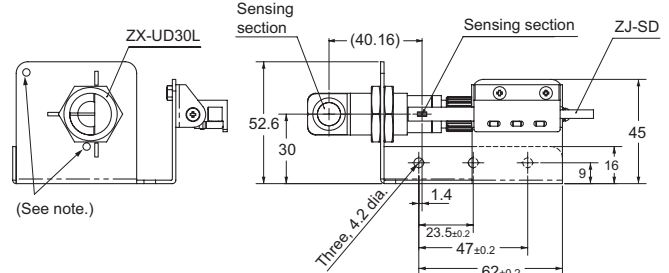
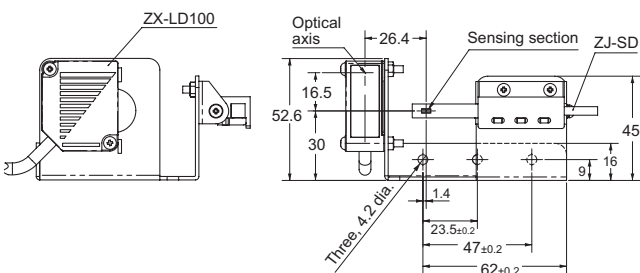
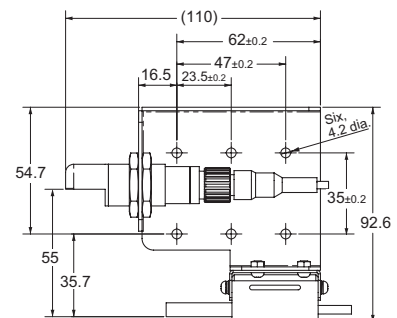
Sensor Head Mounting Bracket for Distance Compensation
ZJ-XBU1



■ Dimensions with ZX-LD100 Sensor Head



■ Dimensions with ZX-UD30L Sensor Head



Note: Mounting holes for the type ZX-LD100.

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